I hereby certify that this Transmittal Letter, enclosed application and any other documents referred to as enclosed herein, are being deposited in an envelope with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 , Label No. EF 278 654 876 US on the date below and addressed to the U.S. Patent and Trademark Office, Box Patent Application, P. O. Box 2327, Arlington, VA 22202.

Date: November 28, 2001 By: Lynnea B Anderson

DOCKET NO.: 50225-8066.US08

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:

Manz *et al.*

SERIAL NO.: Not Yet Assigned

FILED: Concurrently Herewith

FOR: **METHOD FOR CONTROLLING SAMPLE INTRODUCTION IN MICROCOLUMN SEPARATION TECHNIQUES AND SAMPLING DEVICE**

EXAMINER: Unknown

ART UNIT: Unknown

PRELIMINARY AMENDMENT

U.S. Patent and Trademark Office
Box: Patent Application
P. O. Box 2327
Arlington, VA 22202

Sir:

Prior to examination and calculation of the filing fee in the above-identified application, please amend the above-identified application as follows:

In the Specification:

On page 1, after the title "Method for Controlling Sample Introduction in Microcolumn Separation Techniques and Sampling Device", please add the following paragraph:

-- This application is a continuation of application serial no. 09/657,772 filed September 8, 2000, now pending; which is a continuation of application serial no. 08/226,605 filed April 12, 1994, now U.S. Patent No. 6,280,589; which claims the benefit

under 35 U.S.C. §119 of European application serial no. 93 810 272.0 filed April 15, 1993, now published as EP 0 620 432 A1, which disclosures are all incorporated herein by reference.--

In the Claims:

Cancel claims 1-18, without prejudice, and add new claims 19-45 as follows:

19. (New) A microfluidic device, comprising:

a body structure comprising a main channel and a sample loading channel fabricated therein, the main channel intersecting the sample loading channel, which sample loading channel is fluidly coupled to a source of at least one sample material and a fluid reservoir; and,

a transport system coupled to the sample loading channel, the transport system comprising one or more control devices which direct movement of the at least one sample material through the sample loading channel to a position proximal to the intersection of the sample loading channel and the main channel, which one or more control devices concomitantly direct flow of material through the main channel.

20. (New) The microfluidic device of claim 19, further comprising, an instruction set for injecting the at least one sample material into the main channel and electroosmotically or electrophoretically flowing the resulting injected sample through at least a portion of the main channel while simultaneously pre-loading an additional sample into the sample loading channel.

21. (New) The microfluidic device of claim 19, further comprising an instruction set for injecting the additional sample into the main channel and electroosmotically or electrophoretically flowing the resulting injected additional sample through at least a portion of the main channel while simultaneously pre-loading a further additional sample into the sample loading channel.

22. (New) The microfluidic device of claim 19, wherein the loading channel is fluidly connected to a plurality of reservoirs comprising at least three reservoirs, which at least three reservoirs are arranged on a surface of the body structure at regularly spaced intervals, wherein two of the at least three reservoirs are disposed on a first side of the main channel and one of the at least three reservoirs are disposed on a second side of the main channel and wherein at least one of the at least three reservoirs corresponds to the source of at least one sample material or the fluid reservoir.

23. (New) A microfluidic device of claim 22, comprising at least six reservoirs arranged on the surface of the body structure at regularly spaced intervals, which reservoirs are fluidly connected to the loading channel and wherein at least one of the at least six reservoirs corresponds to the source of at least one sample material or the fluid reservoir.

24. (New) The microfluidic device of claim 23, wherein three of the at least six reservoirs are disposed on a first side of the main channel and three of the at least six reservoirs are disposed on a second side of the main channel.

25. (New) The microfluidic device of claim 22, comprising at least eight reservoirs arranged on the surface of the body structure at regularly spaced intervals, which reservoirs are fluidly connected to the loading channel and wherein at least one of the at least eight reservoirs corresponds to the source of at least one sample material or the fluid reservoir.

26. (New) The microfluidic device of claim 25, wherein four of the at least eight reservoirs are disposed on a first side of the main channel and four of the at least eight reservoirs are disposed on a second side of the main channel.

27. (New) The microfluidic device of claim 22, wherein the reservoirs of the device are arranged on approximately 9 mm centers.

28. (New) The microfluidic device of claim 22, wherein the reservoirs of the device are arranged on approximately 4.5 mm centers.

29. (New) The microfluidic device of claim 22, wherein the reservoirs of the device are arranged on approximately 2.25 mm centers.

30. (New) The microfluidic device of claim 22, wherein the reservoirs of the device are arranged at a density greater than about 2 reservoirs per centimeter^2.

31. (New) The microfluidic device of claim 22, wherein the reservoirs of the device are arranged at a density greater than about 4 reservoirs per centimeter^2.

32. (New) The microfluidic device of claim 22, wherein the reservoirs of the device are arranged at a density greater than about 8 reservoirs per centimeter^2.

33. (New) The microfluidic device of claim 22, comprising at least four reservoirs substantially equidistant from the intersection of the loading channel and the main channel.

34. (New) The microfluidic device of claim 33 further comprising at least one electrode in contact with each of the at least four wells.

35. (New) The microfluidic device of claim 22, wherein the channels of the device are approximately the same width and depth.

36. (New) The microfluidic device of claim 22, wherein the channels of the device comprise at least one dimension between about 1 and 500 microns.

37. (New) The microfluidic device of claim 22, wherein the channels of the device have a depth of about 12 microns and a width of between about 30 and 70 microns.

38. (New) The microfluidic device of claim 19, further comprising at least one pre-loading module which comprises a sample reservoir fluidly connected to the loading channel and a waste reservoir fluidly connected to the loading channel, wherein, during operation of the device, material is flowed from the sample reservoir to a position in the loading channel, which position is proximal to the intersection of the loading channel and the main channel, by applying a voltage difference between the waste well and the sample well, wherein movement of the material to the position proximal to the intersection is made substantially without affecting movement of a second material in the main channel.

39. (New) The microfluidic device of claim 19, wherein the body structure is fabricated from one or more of: a silica based substrate and a polymeric material.

40. (New) The microfluidic device of claim 19, wherein the body structure is fabricated from one or more of: a polydimethylsiloxane, a polymethylmethacrylate, a polyurethane, a polyvinylchloride, a polystyrene polysulfone, a polycarbonate, a polymethylpentene, a polypropylene, a polyethylene, a polyvinylidine fluoride, ABS, glass, quartz, silicon and polysilicon.

41. (New) The microfluidic device of claim 19, wherein the body structure is fabricated from a first substrate having grooves fabricated thereon, which first substrate is overlaid by a second

substrate, wherein the first and second substrates are fabricated from a material independently selected from: a polydimethylsiloxane, a polymethylmethacrylate, a polyurethane, a polyvinylchloride, a polystyrene polysulfone, a polycarbonate, a polymethylpentene, a polypropylene, a polyethylene, a polyvinylidine fluoride, ABS, glass, quartz, silicon and polysilicon.

42. (New) The microfluidic device of claim 41, wherein the grooves are embossed or etched on the first substrate.

43. (New) The microfluidic device of claim 19, wherein the main channel comprises a separation medium disposed therein.

44. (New) The microfluidic device of claim 19, wherein the main channel comprises a sieving matrix disposed therein.

45. (New) The microfluidic device of claim 19, wherein the one or more control devices include one or more of:

a voltage regulator which regulates voltage between the sample material source and the fluid reservoir;

a pressure regulator which regulates pressure at the sample material source or the fluid reservoir; or,

a hydrodynamic force regulator which regulates hydrodynamic force at the sample material source or the fluid reservoir.

REMARKS

Claims 1-18 have been cancelled, and new claims 19-45 have been added. Claims 1-27 have been copied from U.S. Patent No. 6,153,073, presented herewith as claims 19-45, for the purpose of requesting an interference. Applicants will file a formal Request for Interference Under 37 C.F.R. § 1.607 in due course.

Attached is a version with markings to show changes made to the specification by the current amendment, pursuant to 37 C.F.R. §1.121(b)(iii). The attached page is captioned "Version with Markings to Show Changes Made".

If there is any fee due in connection with the filing of this Preliminary Amendment, please charge the fee to our Deposit Account No. 50-0665.

If the undersigned agent can be of assistance in expediting this matter, please do not hesitate to call.

Respectfully submitted,

Jacqueline F. Mahoney

Date: Nov. 28, 2001

Jacqueline F. Mahoney
Registration No. 48,390

CORRESPONDENCE ADDRESS
Customer No. 22648
(650) 838-4410

Version with Markings to Show Changes Made

In the specification:

This application is a continuation of application serial no. 09/657,772 filed September 8, 2000, now pending; which is a continuation of application serial no. 08/226,605 filed April 12, 1994, now U.S. Patent No. 6,280,589; which claims the benefit of European application serial no. 93 810 272.0 filed April 15, 1993, now published as EP 0 620 432 A1, which disclosures are all incorporated herein by reference.